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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/565,449

08/01/2006

Robert A. Dane

SOLAR 1

9828

7590

06/23/2009

John H Thomas  
536 Granite Avenue  
Richmond, VA 23226

EXAMINER

VASUDEVA, AJAY

ART UNIT

PAPER NUMBER

3617

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/565,449	<b>Applicant(s)</b> DANE ET AL.	
	<b>Examiner</b> Ajay Vasudeva	<b>Art Unit</b> 3617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 9-11, 14-20 and 22 is/are rejected.
- 7) ☒ Claim(s) 4-6, 12, 13 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/05/2009</u> .   | 6) <input type="checkbox"/> Other: _____                          |

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## **DETAILED ACTION**

### ***New Examiner***

1. The instant Application has been reassigned to the undersigned Examiner

### ***New Rejection***

2. This Office Action contains a non-final rejection based on new grounds. The examiner regrets the resulting inconvenience to the applicant and his counsel.

In an effort to expedite the prosecution, the examiner contacted applicant's counsel on 6/11/2009 to discuss the possibility of an allowance by Examiner's amendment. However, no agreement was reached.

### ***Drawings***

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

- A payload compartment 202, as set forth on page 5 (line 33)
- A guidance system 315, as set forth on page 7 (line 22)

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following must be shown or the feature(s) canceled from the claim(s).

- Electrical capacitors, as set forth in claim 18.
- Fluid accumulators, as set forth in claim 19.

No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement

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drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

5. The Specification is objected to for the following reasons:
- On page 7 (line 21), before "ambient solar energy", change "**collector**" to – **collect** --.
  - On page 8 (line 5), after "photovoltaic cells", change "**406**" to – **405** --.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 16, 17 and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 16 recites the hybrid energy propulsion system utilizing, in addition to wave or water current energy, only renewable energy sources including temperature differential.

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Similarly, claim 17 recites the electrical machine as being driven by the drive element through wave action or water currents.

Further, claim 19 recites a rapid energy discharge devices comprising fluid accumulators.

However, the Specification does not sufficiently disclose any specific equipment or mechanism that is capable of capturing/utilizing wave or water current energy, or a temperature differential for providing a propulsive energy, as being claimed. Further, the Specification also lacks sufficient detail on the mechanism of rapid energy discharge utilizing fluid accumulators. Therefore, in absence of sufficient detail of the invention, a person skilled in the art would not be able to make and/or use the claimed invention.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 15, use of the limitation “wherein the hybrid propulsion system further includes a fuel cell for emergency use, such as emptying ballast tanks” (emphasis added) renders the claim indefinite. The claim is considered indefinite because it uses a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim), the resulting claim thereby failing to clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c).

*Note the explanation given by the Board of Patent Appeals and Interferences in Ex parte Wu, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by “such as” and then narrow language. The Board stated that this can render a*

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*claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of Ex parte Steigewald, 131 USPQ 74 (Bd. App. 1961); Ex parte Hall, 83 USPQ 38 (Bd. App. 1948); and Ex parte Hasche, 86 USPQ 481 (Bd. App. 1949).*

In the present instance, claim 15 recites the broad recitation “fuel cell *for emergency use*”, and the claim also recites “such as emptying ballast tanks” which is the narrower statement of the range/limitation.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-3, 7, 9-11, 14, 15, 18, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huntsman (US 6,807,921 B2) in view of Patterson et al. (US 5,995,882 A).

Huntsman shows an unmanned ocean vehicle [200] that is capable of operating below the surface of a body of water. The vehicle comprises an enclosed hull [101] for housing various system components, wherein the enclosed space is considered to be a payload bay (col. 3, lines 1-2). The vehicle comprises a propulsion system having an electricity collection and energy storage system [100]. The energy storage system comprises a plurality of batteries (col. 6, lines 53-55). The electricity collection system comprises a plurality of different energy collectors [102] to power the propulsion system (col. 4, lines 47-55). Because the propulsion system is powered by an “array” of different energy collectors, it is considered to be a “hybrid” propulsion system.

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Regarding the limitation “*a hybrid propulsion system having ... energy stores adapted for utilizing at least (i) solar energy, (ii) wave or water current energy, and (iii) wind energy*”, the phrase “adapted for utilizing” has been interpreted to mean as “capable of utilizing”. As such, applicant may note that the claim merely requires the energy store to be “capable of utilizing” a combination of the solar, wave or water current, and wind energy capturing devices, but actually does not positively recite the attachment of such capturing devices on the vehicle. In the present case, the energy stores of Huntsman are configured for utilizing the electricity generated by different energy collectors. Although these energy collectors are not a combination of solar, wave or water current, and wind energy capturing devices, the energy stores of Huntsman are still considered as “capable of” utilizing such a combination as an alternative supply of electricity. Further, the vehicle comprises a plurality of sensors for detecting predetermined environmental parameters (col. 7, line 65 through col. 8, line 7). The hybrid propulsion system includes an electrical machine [228] mechanically coupled to a fluid drive element [206], wherein the electrical machine is supplied from the energy stores to drive the fluid drive element in a motor mode.

Although Huntsman shows the vehicle as having a plurality of sensors, it is silent on a communication system for transmitting data from the sensors about selected environmental parameters to, and for receiving command signals from, one or more remote stations or cooperating ocean vehicles (claims 1 and 22).

Patterson et al. show an unmanned ocean vehicle [10] having a plurality of sensors, such as resistance temperature detection (RTD) sensors, as well as conductivity, temperature and depth (CTD) sensors (see col. 5, line 40 and line 45; col. 7, line 42; and fig. 9). A

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communication transceiver system [127], which functions both as a transmitter and a receiver, is provided to establish a packet modem connection via an antenna [55]. The communication system is capable of transmitting data from the sensors to one or more remote stations or cooperating ocean vehicles (see col. 7, lines 26-28, lines 35-47; fig. 9. Also, see col. 4, lines 8-10 as an alternative communication system). The communication system is also capable of receiving command signals for the vehicle control system and the sensors from one or more remote stations or cooperating ocean vehicles (see col. 5, lines 28-30; and col. 7, lines 35-47).

It would have been obvious for a person skilled in the art at the time of the invention to provide the vehicle of Huntsman with a communication transceiver system, as taught by Patterson et al. Having such a system would have enabled one to retrieve data from the vehicle at regular intervals while the vehicle was still submerged in water. Having such a system would have also enabled one to remotely change the sensors parameters, thereby enabling an efficient and accurate data gathering for different/changing environmental conditions.

Re claim 2, when observed from a distance, the hull would resemble an aquatic animal.

Re claim 3, the enclosed hull is capable of facilitating (and therefore adapted to facilitate) selective operation of the vehicle below the water surface.

Re claim 7, the energy collectors comprise solar photovoltaic collector as one of the options (col. 8, line 42), and the energy stores [106] comprises a plurality of batteries (fig. 1; col. 5, line 37; and col. 6, lines 53-55). The solar energy collectors can be coupled to the electricity storing batteries.

Re claim 9 and 18, the energy stores include capacitors, which are considered to be rapid energy discharge devices (col. 5, line 51).

Re claim 10, the payload bay is internally powered in order to carry electronic equipment supporting the environmental sensors for oceanographic



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Re claim 11, the environmental sensors include sensors selected from the group that includes radars (col. 8, line 1).

Re claim 14, the vehicle is considered as being capable of diving under the surface for prolonged periods using stored energy.

Re claim 15, in an alternative interpretation, the flywheel [106] can be considered to be the primary energy store, while the batteries can be broadly considered to be "fuel cells". Such fuel cells are capable of use in emergencies

Re claim 20, the vehicle bay carries cameras, lights, radars, sonar, communication equipment, etc., all of which can be used for life-saving, search and rescue operations.

#### ***Allowable Subject Matter***

12. Claims 4-6, 12, 13 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

13. Applicant's arguments with respect to claims 1-3, 7, 9-11, 14-20 and 22 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

14. The prior art made of record in the attached PTO Form 892, but not yet relied upon, is considered pertinent to applicant's disclosure.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ajay Vasudeva whose telephone number is (571) 272-6689. The examiner can normally be reached on Monday-Friday 12:00 -- 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, S. Joe Morano can be reached on (571) 272-6684. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ajay Vasudeva/  
Primary Examiner  
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